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TITLE : STEEL SHEET HAVING HIGH STRETCH-FLANGING PROPERTY AND EXCELLENT
SHAPE FREEZABILITY AND ITS PRODUCTION METHOD

ABSTRACT : PROBLEM TO BE SOLVED: To provide a thin steel sheet worked mainly by bending in
which the amount of spring back and the amount of wall camber are small, and which has
excellent shape freezability and hole expandability.

SOLUTION: This hot rolled steel sheet and cold rolled steel sheet having high
stretch-flanging properties and excellent shape freezability has a composition containing,
by mass, 0.0001% to 0.3% C, 0.001 to 3.5% Si, 0.05 to 3% Mn, $\leq 0.2\%$ P, $\leq 0.03\%$ S,
0.01 to 3% Al, $\leq 0.01\%$ N and $\leq 0.01\%$ O, and the balance iron with inevitable impurities
and has a composite structure formed of ferrite or bainite as the main phase by area ratio,
and the total area ratio of pearlite, martensite and retained austenite is $\leq 5\%$, also, the
average value of the X-ray random intensity ratios in the orientation groups of
[100]<011>; to [223]<110>; of the sheet plane in the sheet thickness of at least 1/2 is
 ≥ 3.0 , besides, the average value of the X-ray random intensity ratios in the three crystal
orientations of [554]<225>;, [111]<112>; and [111]<110>; is ≤ 3.5 , and further, at least
one of the (r) value in the rolling direction and the (r) value in a direction orthogonal to the
rolling direction is ≤ 0.7 .

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